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256. Epidemiology, diagnosis and treatment in obstructive sleep apnoea

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The SHIP-Trend study – Epidemiology of sleep apnoea in Germany
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The SHIP-TREND study (Study of Health in Pomerania) is the first German population based study which implemented polysomnography (PSG) as one of the key investigations. 6000 inhabitants are drawn from the inhabitants registry. The main focus of SHIP-Trend is a full body MRI to evaluate the health status in northeast of Germany. An increased cardiovascular risk has been found in this region.

Cardiorespiratory PSG will be performed in all subjects between 20 and 79 years of age which agreed to participate. These subjects completed the Insomnia Severity Index (ISI scale), Epworth Sleepiness Scale (ESS), Pittsburgh Sleep Quality Index (PSQI) and Restless-Legs Syndrome Diagnostic Index (RLS-DI). Additionally all participants answered some specific questions about sleep duration and quality.

Until December 2010 2769 volunteers entered the study and 966 of them underwent PSG. In a preliminary analysis 502 subjects were analyzed (225 female, 277 male). The mean age was 53.03 years. 117 of 502 subjects (23.31%) showed an apnoea-hypopnoea index (AHI) greater than 15 per hour sleep. There was a significant difference in gender when investigating the prevalence of obstructive and central apnoeas. Mean AHI in women was 7.2 per hour sleep and in men 13.4 per hour sleep. Independent of gender AHI increased with age.

There is a high prevalence of obstructive sleep apnoea in pommeranian population. Men showed more nocturnal breathing events than women. We detected in both groups a progression of breathing events with age. After completing all subjects the influence of BMI and comorbid conditions will be analyzed.

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Gender differences in sleep apnea severity are diminished during REM sleep
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Background: It has been shown previously that sleep apnea (SA) is substantially more common and more severe in men than women. Yet, the precise pathophysiological mechanisms accounting for gender differences in SA remain less well understood.

Method: A retrospective chart review was performed on patients who underwent in-lab polysomnography between January 2009 and December 2010 to examine the influence of gender on the polysomnographic features of SA. From 227 consecutive adults who met inclusion criteria, we identified 46 male-female pairs matched individually for age (mean±SD 52±9 years) and BMI (31±6 kg/m²).

Results: Despite similarities in age, BMI, sleep efficiency, and Epworth Sleepiness Scale score, men had higher total apnea-hypopnea index (AHI) [median (interquartile range) 21.3 (8.6-43.4) vs. 8.8 (1.7-26) events/h; $P<0.001$] and the level of the AHI during NREM sleep [21.6 (8.5-43.7) vs. 7.4 (0.7-23.2) events/h; $P<0.001$] than did women. Men also had higher oxygen desaturation index [24 (10-53.1) vs. 14.8 (3.1-29.9) events/h; $P<0.001$] and lower mean nocturnal oxyhemoglobin saturation [93 (91-94) vs. 94 (92-95)%; $P=0.007$]. Surprisingly, there was no statistical difference in AHI during REM sleep between men and women [21.3 (7-46.7) vs. 14.3 (2.1-45.8) events/h; $P=0.662$]. In addition, compared to men, women had a significantly higher difference between REM-AHI and NREM-AHI ($P=0.023$).

Conclusions: To conclude, SA is less severe in women than men because of milder SA during NREM sleep, which is independent of age and BMI. Our findings indicated that severity of SA is similar in men and women during REM sleep, suggesting differences between the sexes in upper airway function during sleep in adults with SA.

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Gender differences in obstructive sleep apnea syndrome (OSAS): A clinical study (1303 patients)

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Background: Few studies focused on gender differences among patients with OSAS. The prevalence of hypertension was not elucidated after controlling for OSAS severity, age, and obesity grade in men and women, separately, and conflicting data were reported on the effect of gender on susceptibility to hypertension in OSAS.

Aim: To retrospectively assess gender-specific differences in patients with diagnosis of OSAS, with particular attention devoted to hypertension.

Methods: 1303 patients (20-90 years, 75% males) with symptoms suggestive of OSAS underwent overnight home polysomnography, and the apnea-hypopnea index ≥ 10 defined OSAS diagnosis.

Results: 73% of males and 56% of females had OSAS. Prevalences of obesity, metabolic disorders, and hypertension were significantly higher in females than males independent from OSAS. Females were significantly older than males only among the patients with OSAS. The risk for OSAS was significantly higher in males than females only in middle ages (40-59 years). OSAS was associated with obesity in both males (Odds ratio, OR 3.01, 95% Confidence Interval 2.18-4.15) and females (2.70, 1.64-4.45). Severe OSAS was a risk factor for hypertension independent from obesity in males (1.67, 1.02-2.63, and 2.61, 1.50-4.54, for non obese and obese, respectively). OSAS, whatever was its severity, was related to higher risk for hypertension neither in non-obese nor in obese females.

Conclusions: Although a clear male predominance, we confirmed that with increasing age the prevalence of OSAS in women becomes comparable to that of males. Among OSAS patients, the male gender was related to higher susceptibility to hypertension.

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Gender differences in sleep pattern in a cohort of patients with obstructive sleep apnea syndrome

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Introduction: Besides sleep related breathing disorders, other factors influence sleep pattern and polysomnographic parameters. Especially gender differences have been described that must be considered when making therapeutic decisions. Using data from a cohort of patients with OSAS, we will present gender related differences derived from a polysomnographic (PSG) examination prior to any therapeutic intervention.

Methods: Patients with OSAS who were referred to our sleep disorders centre with suspected sleep disordered breathing were monitored during the diagnostic visit and filled in the Epworth Sleepiness Scale. PSG recordings were visually analysed and parameters essential for sleep pattern rating were collected.

Results: Data from 938 patients were collected, consisting of 790 male (age 54.6±12.3 years) and 148 female (age 58.5±12.8 years) subjects. Sleepiness among genders was not different (males: 380 ESS<11, 410 ESS≥11; females 81 ESS<11, 67 ESS≥11; $\chi^2 p=0.15$). However, females had less breathing disorders (AHI 25.7±24.9/h) than males (AHI 33.0±26.9/h; $p<0.05$). Percentage of N1 was lower in females than males (10.9±10.4 vs. 16.1±14.4%; $p<0.01$) while N3 was increased in females (19.9±10.7 vs. 16.2±10.4%; $p<0.01$). Corresponding to AHI values, arousal indices were lower in females than males (38.3±22.1 vs. 44.4±25.3/h; $p<0.05$).

Conclusion: We could show significant differences in light sleep and deep sleep proportions and arousal indices between male and female OSA patients. In contrast, the proportion of sleepy patients was not significantly different. These results may help to understand gender related differences in reported daytime symptoms and facilitate therapeutic decisions.

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Obstructive sleep apnoea/hypopnoea syndrome in middle-aged patients: Differences regarding the gender

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Introduction: It is well known that there are differences of obstructive sleep apnoea/hypopnoea syndrome (OSAHS) regarding the gender in the elderly. The aim of this study was to evaluate the possible differences of OSAHS between middle-aged patients.

Methods: Three hundred and sixty five subjects, aged 45 until 65 years, suspected OSAHS were examined by full polysomnography, in our Sleep Laboratory the last years. Two hundred and ninety of them were suffered from OSAHS, 232 men, aged 53.75±5.72 and 58 women, aged 54.73±4.34 (m±SD). The evaluated parameters were the daytime sleepiness (scoring by Epworth sleepiness scale), the apnoea/hypopnoea index (AHI) and the duration of nocturnal hypoxemia. The statistical analysis was done by "t-test" method.

Results: There were statistically significant differences between men and women regarding the body mass index (BMI) (34.08±6.74 vs 37.71±11.38 respectively,

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$p=0.002$), the daytime sleepiness (ESS) (12.01 ± 5.06 vs 10.05 ± 5.43 , respectively, $p=0.01$), and the apnoea-hypopnoea index (AHI) (39.07 ± 24.40 vs 31.28 ± 26.42 , respectively, $p=0.03$). There is no difference about the duration of nocturnal hypoxemia between the two groups.

Conclusion: It seems that the prevalence of OSAHS is much higher in middle-aged men. Compared with men, middle-aged women although had greater BMI, had less severity of OSAHS and smaller daytime sleepiness. These findings may reflect structural and functional differences between the sexes in upper airways during sleep.

P2189**Domiciliary non-invasive ventilation in patients 65 years or older. A case series study**

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Aim: To describe the clinic characteristics of patients with domiciliary non-invasive ventilation (DNIV) in 65 years or older at BIPAP onset in a Sleep Disorders Unit (SDU).

Methods: Transversal descriptive study of a case series between February 2000 and June 2010. Inclusion criteria: 1. Age ≥ 65 years at BIPAP onset. 2. Polysomnography or Polygraphy available prior BIPAP prescription.

Definitions: SAHS was considered when AHI ≥ 10 and severe SAHS if AHI ≥ 30 ; Obesity Hypoventilation Syndrome (OHS) was defined as a BMI ≥ 30 and PaCO₂ ≥ 45 mmHg at daytime; Excessive Daytime Somnolence (EDS) if Epworth Somnolence Scale (ESS) score ≥ 12 .

Results: 82 out of 153 patients with DNIV met the inclusion criteria. 53 (65%) women and 29 (35%) men. Values expressed by mean \pm standard deviation were: Age when starting treatment: 72 ± 4 ; BMI: 37.54 ± 6.9 ; neck circumference: 41.9 ± 3.5 cm; ESS: 10.7 ± 5.3 ; EDS: 37 (41%) patients; AHI: 31.7 ± 22 . SAHS was diagnosed in 75 (91.5%) patients and was severe in 36 (44%). BIPAP prescription was due to: OHS in 48 (59%) patients, combined pathology in 20 (24%) patients, neuromuscular disease in 9 (11%) and COPD in 5 (6%) patients.

BIPAP was initially prescribed in 38 (46%) patients, most of them with neuromuscular disease and combined pathology ($p=0.017$). Conversely, in 44 (54%) patients, most of them with OHS or COPD ($p=0.017$), it was prescribed CPAP at first and changed to BIPAP.

Conclusions: Half of the patients with DNIV were ≥ 65 years old at the beginning of the treatment. All patients were obese and most of them, women. The most common cause of prescribing BIPAP was neuromuscular disease and the most common cause of change from CPAP to BIPAP was OHS.

P2190**Relationship between obstructive sleep apnea syndrome severity and age**

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Aim: To investigate the effect of age on severity of obstructive sleep apnea syndrome (OSAS) severity was the aim of this study.

Material and Method: The files of 874 OSAS patients diagnosed in our sleep laboratory between January 2005 – January 2010 were retrospectively analysed. Polysomnography was performed with Sleep Screen - Viasys device and scoring was done according to the criteria of Rech-Schaffen Kales. Chi-square and student's t-test was used in statistical analysis.

Results: There were of 874 OSAS cases in the study. The mean age was 49.1 ± 10.7 and of the cases, 602 (68.9%) were male, 272 (31.1%) were female. The severity of OSAS was mild in 235 (26.9%), moderate in 224 (25.6%) and severe in 415 (47.5%). A great majority of OSAS cases were belonging (65.2%) 40-59 years age group. Younger cases were 18.2% and older cases were 16.7% of OSAS patients. Mean AHI was 33.9 in younger (age <40), 36.8 in middle age (age=40-59) and 42.4 in older (age ≥ 60) group. Age was <50 in 60.4% of mild OSAS cases whereas was the same in 50% of moderate OSAS and in 42.1% of severe OSAS cases. The severity of OSAS was statistically significantly increasing as age was advancing ($p<0.05$). As the cases were grouped as older and younger than 50 years of age, AHI, AI and ODI were statistically significantly higher and minimum saturation was significantly lower in older age group ($p<0.05$).

Conclusion: OSAS is getting worse as the age is getting advanced.

P2191**Clinical characteristics in octogenarian patients with sleep apnea hypopnea syndrome**

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Objective: To describe the clinical characteristics of patients of 80 years old or older at the moment of the study, evaluated in a Sleep Disorders Unit (SDU).

Methods: Transversal descriptive study in a 10 year period (2000-2010). All

patients 80 years old or older at the moment of sleep study were included. SAHS was considered when AHI ≥ 10 and classified as severe if AHI ≥ 30 .

Results: 144 (1.8%) out of 7989 patients studied in our SDU were ≥ 80 years old at the moment of the sleep study. No differences of gender were observed. The patients' characteristics expressed by mean \pm standard deviation were: Age 82 ± 1.7 ; BMI 33 ± 4.3 ; neck circumference 41 ± 9 ; Epworth 12.52 ± 5.3 . Snoring occur in 96%, witnessed apneas in 60%, nocturia in 93% and morning headaches in 47%. Principal comorbidities were hypertension 79%; dyslipidemia 29%; diabetes 32%; ischemic cardiovascular disease 15%; cerebrovascular disease 14%; arrhythmias 25%; 2% were active smokers and 3% had alcohol addiction. One or more comorbidities were observed in 127 patients (90.7%). Sleep studies consisted of: 65 polysomnographies (45%) and 79 polygraphs (55%) and the results, expressed in mean \pm standard deviation, were: AHI 55.8 ± 18.3 ; CT90 43 ± 33.5 and ODI 42.8 ± 22.8 . SAHS was diagnosed in 135 patients (94%) and was severe in 95 (66%). Conservative treatment was prescribed to 52 patients (36%), while in 90 patients (62%) were prescribed CPAP and 2 patients (2%) non invasive ventilation. **Conclusion:** Octogenarians represent only a small percentage of the population derived to our SDU. Most of them were symptomatic, had comorbidities and SAHS and, in more than a half of them, it was severe, being prescribed CPAP.

P2192**Pediatric obstructive sleep apnea: Experience of the multidisciplinary sleep unit of Fundacion Jimenez-Diaz (Madrid-Spain)**

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Introduction: The prevalence of pediatric Obstructive Sleep Apnea (OSA) ranges between 0.2%-4.1%. Adenotonsillar hypertrophy is the main cause and its treatment is surgical. The primary objective of this paper is to describe the pediatric population that is admitted to our Multidisciplinary Sleep Unit (MSU) for study of suspected OSA.

Methods: Observational retrospective study in which a Polysomnography (PSG) was performed to 87 children derived from Pediatric Pulmonology consult for suspected OSA between December 2009-January.

Contingency tables and Fisher's P were used for data analysis.

Results: In our studied population: 34.5% female and 65.5% male; median age: 6.42 years; 7.2% overweight and 27.7% obese.

OSA was diagnosed in 37.9% (72.72% male, 27.27% female); 3.4% mild, 12.36% moderate, 21.8% severe OSA. Their symptoms were: snoring 100%, observed apneas 97%, restless sleep 72.7%, labored breathing 45.5% and enuresis 40.6%. Significant association was found between OSA and obesity, observed apneas, enuresis, adenoid and tonsillar hypertrophy ($p=0.04$, $p=0.02$, $p=0.024$, $p=0.027$, $p=0.040$ respectively). Mean PSG parameters: sleep efficiency: 79.32%, AHI: 19/hour, Oxygen desaturation index (IDO): 14.35/hr, time under 90% oxygen saturation (T90): 3.97% and mean microarousal index: 19.56/hr. Surgically treatment performed in 60% (75% adenotonsillectomy, 20% adenoidectomy, 5% tonsillectomy)

Conclusions: 1. Enuresis, observed apneas, adenotonsillar hypertrophy and BMI had a significant association with OSA in our pediatric population.

P2193**Evolution of treatment with CPAP over 21 months of follow-up in patients with sleep apnea hypopnea syndrome**

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Objectives: 1) Analyse the evolution of the hours/days ratio of the use of CPAP in patients with sleep apnea hypopnea syndrome over a period of 21 months. 2) Study the factors related to poor treatment compliance (<3.5 hours/night).

Material and method: A total of 83 patients with sleep apnea hypopnea syndrome (AHI 49 ± 22 h-1) treated with CPAP were included. The utilisation ratio of CPAP was recorded at 3, 6, 9, 12, 15, 18, and 21 months.

Anthropometric and socio-work variables were also recorded, as well as sleep and CPAP parameters, Epworth scale, comorbidity and evolution.

Results: The ratio (hours/day) of real use of CPAP at 3, 6, 9, 12, 15, 18, and 21 months was: 4.9 ± 2.3 ; 5.1 ± 2.2 ; 5.3 ± 2.5 ; 5.2 ± 2.4 ; 5.3 ± 2.5 ; 5.2 ± 2.6 y 5.2 ± 2.5 . A univariate analysis and another adjusted by variables showed that the time of use did not differ significantly over the 21 months.

Patients who did not comply with treatment (31.6%; use < 3.5 h/d) had a lower cervical perimeter (39.6 ± 13 vs 44.7 ± 3.6 ; $p<0.03$), lower AHI (38.9 ± 20.1 vs. 53.8 ± 21.5 ; $p<0.005$), greater minimum SpO₂ (81.2 ± 4.2 vs. 66.5 ± 17.4 ; $p<0.016$), lower desaturation index (37.5 ± 17.4 vs. 59 ± 27.9 ; $p<0.007$) and lower CPAP pressure (7.8 ± 1.0 vs. 8.8 ± 2.2 ; $p<0.046$). The oxygen desaturation index was an independent predictor of poor treatment compliance ($r^2=0.465$; $p=0.003$).

Conclusions: 1) The CPAP use pattern 3 months after starting treatment is stably maintained over a 21-month period.

2) Those who did not comply with treatment presented less serious sleep parameters, lower cervical perimeters, and lower prescribed CPAP pressure than those who complied.

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P2194**Sleep-disordered breathing (SDB) and obstructive sleep apnea (OSA) in elderly population with high and low BMI**

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Background: SDB has a high prevalence in the elderly population. OSA has been recognized in 7-18% of elderly people.

Aim: Evaluate clinical and sleep characteristics of OSA in a group of elderly patients with SDB according to BMI.

Methods: 47 patients (34M,13F) over 70 yrs old with SDB divided in 2 groups according to BMI (< or > than 25.0). SDB are studied by means of cardiorespiratory polygraphy. Descriptive statistics were calculated for all variables. Statistical analyses were performed using S-Plus.

Results: 19 patients with BMI < 24.9 (group A) and 28 with BMI > 24.9 (group B). The group A (Mean age 75.6±4.2, BMI 23.6, SaO₂ 92.7±1.9%) reported more difficulty falling asleep (p<0.001) and more daytime sleepiness (p=0.0014); AH index were 18.3±1.4 with prevalence of obstructive events as well as group B (AH index 17.6±1.5). Time in bed was 258.6±60.0 min and in group A. Group B (74.9±3.9 mean age, BMI 35.2±5, SaO₂ 90.7±5.0) had AH index and mean hypopnea duration (27.5±1.1 vs 38.6±4.2) lower than group A. Group B had no longer time in bed (286.2±76.2 min) than other group. Single regression analysis were performed by age related to time in bed, hypopnea duration and apnea duration and was statistically significant only in group A according to time to bed and age (p=.035).

Conclusion: OSA in elderly patients is underdiagnosed. Atypical presentation in elderly patients are common. Low BMI in elderly not excluded OSA risk. We emphasized the need for adjusting the OSA criteria in elderly persons to avoid interpreting OSA symptoms attributable to other diseases more common in old patients.

P2195**Follow-up of children with obstructive sleep apnea syndrome treated with adenotonsillectomy**

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Background: Hypertrophy of adenotonsillar tissue is an undisputed contributor to the development of OSAS in otherwise healthy children. A multicenter retrospective study shows the surgery approach has a resolution rate of about 27%. So it will be important to identify children who will not resolve OSAS after adenotonsillectomy (AT) in order to plan an appropriate and integrated treatment for them.

Aim: To evaluate the role of AT in the outcome of children with OSAS.

Methods: Children affected by adenotonsillar hypertrophy, who underwent adenotonsillectomy for moderate-severe OSAS, were enrolled, from 2008 to 2009. All children underwent a complete clinical examination and overnight polysomnographic study before AT and after 12 months of follow-up.

Results: We included 21 children (mean age 4.09±1.76; M/F 17/4), with a mean body mass index -BMI- of 15.86±2.4 kg/m², with a mean apnea hypopnea index (AHI) of 15.08±8.8 ev/hr. Twelve children (57.1%) had malocclusions. After one year, 13 children showed a complete resolution of disease (61.9%) (AHI 0.3±0.3 ev/hr), while 8 children (38.1%) had a residual disease (AHI 2.6±1.1 ev/hr). Children with a residual disease had a higher BMI at baseline (16.5±3.7kg/m² vs 15.4±1.1 kg/m², p<0.05) and a higher prevalence of malocclusions compared to those with a complete resolution (7/8, vs 5/13, X²=4.86, p<0.05). Stepwise multiple linear regression analysis identify malocclusion as the most important variable influencing the outcome (R²=0.24).

Conclusions: Although AT is the gold standard in children with OSAS and adenotonsillar hypertrophy, treatment of malocclusions need to be added to achieve a complete resolution of the disease.

P2196**Clinical reproducibility of the pediatric sleep questionnaire (PSQ)**

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The Pediatric Sleep Questionnaire (PSQ) has two versions: a shorter one, which has been validated for sleep-related breathing disorders, and an extended version, which deals with a wider range of sleep disturbances. The Spanish version of the PSQ could be a suitable tool both for screening patients who require medical tests and for epidemiological research. Our objective was to evaluate its reproducibility in the clinical setting.

Material and methods: 62 patients in pediatric age were gathered consecutively, 53% were male with a mean age of 5.15 years old (± 3.05) to whom a conventional polysomnography (PSG) was performed because of a probable diagnosis of SAHS. The 24 items of the PSQ (validated Spanish version for sleep-related breathing disorders) were completed at the Pediatric Outpatient Clinic and the night before

the sleep study performed at the Respiratory Care Sleep Unit, both data were compared to let show discrepancies between PSQ scores.

Results: The mean PSQ score at the Pediatric Outpatients Clinic was 9,42 (± 4,77) and the previous score prior the PSG at the Sleep Unit was 8,7±4,99, with a correlation between both of 0,66 (p <0,0001). The statistical concordance between the two determinations of PSQ was moderate considering the cut line when 33% of the items were positive (kappa index 0,4, p= 0,003).

Conclusion: The PSQ score is highly variable when administered sequentially to a clinical pediatric population being evaluated for a potential sleep-related breathing disorder.

P2197**The STOP questionnaire is the best screener for obstructive sleep apnoea syndrome at the sleep clinic**

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It is important to correctly identify high risk Obstructive Sleep Apnoea Syndrome (OSAS) patients to minimize costs. The gold standard for the diagnosis of OSAS remains polysomnography (PSG), but is resource intensive and with restricted availability. We therefore performed a pilot study to compare the *Eppworth, Berlin, STOP and STOPBANG* questionnaires in their ability to identify OSAS confirmed by PSG among high risk patients. Additionally, cut off points to improve clinical prediction of OSAS were explored.

Results: To date a total of 56 patients have complete data. Their mean BMI was 35.7 (±7.9), collar size 43.5 cm (±4.2) and 35 (63%) were male. Based on an AHI ≥ 15, 31 (55%) were diagnosed with significant OSAS. Those with OSAS had significantly higher BMI as well as collar size. The *Eppworth* questionnaire (cut off 10) had a sensitivity of 77% and specificity of 52%, the *Berlin* 97% and 24% respectively, *STOP* 100% and 28%; and *STOPBANG* 100% and 12%.

Conclusions: If only patients with high risk scores were selected for subsequent PSG, 59% (*Eppworth*), 13% (*Berlin*), 86% (*STOP*) and 93% (*STOPBANG*) of the patients would be tested. The *STOP* questionnaire resulted in the best sensitivity/specificity combination (if false negatives are unacceptable) but this would mean that 86% of the patients would have PSG but only 55% would have OSAS. No other combination of factors was found to improve specificity without a considerable decrease in sensitivity.

STOP is the simplest and most effective screening questionnaire to identify patients with OSAS and could reduce the need for PSG by 14%. A larger cohort is needed to confirm these findings and improve specificity of the questionnaires.

P2198**Questionnaire designed to identify patients with moderate/severe sleep apnoea and its correlation with polysomnography**

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Background: Polysomnography (PSG) is used for obstructive sleep apnoea (OSA) diagnosis; due its high cost is necessary to obtain clinical scores to evaluate the probability of OSA.

Aim: Evaluate the utility of the ACHaR as screening test for moderate/severe OSA in subjects recruited in an outpatient clinic.

Methods: Prospective study realized between January 2006 and December 2010. All patients enrolled were studied in a sleep center with full PSG and also completed an easy to apply questionnaire (ACHaR). This test has 4 dichotomized variables: snoring, hypertension, neck circumference (cutoff = 40cm), and reports of nocturnal gasping/choking; having a total score of 0-4 points. A score of 2 or more indicated high risk for moderate/severe OSA (by PSG, apnoea/hypopnea index ≥ 15/hr).

Results: 753 adult patients (74.5% men) were studied (median age = 47.0 yrs.). Using ACHaR, 646 patients (85.8%) were classified as high risk of moderate/severe OSA and 107 patients (14.2%) with low risk. The prevalence of moderate/severe OSA after PSG was different between these 2 groups: 72.4% (high risk) and 24.2% (low risk); p<0.001. The sensitivity, specificity, positive predictive value, negative predictive value, accuracy, and odds ratio (high risk vs. low risk) of the ACHaR score used as screening for moderate/severe OSA were, respectively: 94.7%, 31.2%, 72.4%, 75.7%, 72.9%, and 8.19 [95% CI = 5.09-13.16]. According to the receiver operating characteristic curve, the ACHaR score had area under the curve = 0.63 [95% CI = 0.58-0.67].

Conclusions: This study indicates that the ACHaR questionnaire was good sensitivity in detecting the patients with moderate/severe OSA.

P2199**Continuous positive airway pressure in patients with obstructive sleep apnea: Adherence dependent on apnea-hypopnea index, leakage and mask pressure**

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Background: CPAP (continuous positive airway pressure) is the standard therapy

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for obstructive sleep apnea (OSA). While a lot of studies analysed adherence of CPAP therapy in general, only little is known on adherence dependent on apnea-hypopnea index (AHI), leakage and mask pressure.

Methods: In a retrospective data analysis we determined age-dependent adherence of 4821 German patients (age = 58.4±11.2 years; 17.6% female, 82.4% male) treated with the CPAP device S8 (ResMed, Sydney, Australia). We studied AHI, mean mask pressure, mean leakage, hours of use per night and efficiency (days of use/total days).

Results: Mean therapy duration was 3.5±3.6 years. In the subgroups AHI<5/h, AHI=5-10/h, AHI>10-15/h and AHI>15/h hours used/night (range 368 to 378 min) and days used/week (range 5.8 to 6.2) were similar. Furthermore, adherence was similar in the leakage subgroups <0.1 l/s, =0.1-0.2 l/s, >0.2-0.3 l/s, >0.3-0.4 l/s, >0.4-0.5 l/s and >0.5 l/s in terms of hours used/night (range 361 to 380 min) and days used/week (range 6.0 to 6.2). Up to mask pressure of 14 cmH₂O hours used/night increased significantly. In the subgroup mask pressure=4-6 cmH₂O patients used the device on average 350 min, whereas patients with mask pressure >12-14 cmH₂O used it more than an hour longer (415min). Moreover, there was a continuous increase between the lowest mask pressure subgroup (4-6 cmH₂O) and the highest mask pressure (>14 cmH₂O). Range was 5.7 to 6.5 days used/week.

Conclusion: Adherence to therapy is high and therapeutic efficacy is excellent in long-term CPAP users. Adherence increases with mask pressure.

P2200**Importance of a questionnaire study on Latin American physicians about sleep apnea**

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Introduction: We considered appropriate to investigate the knowledge and attitudes of obstructive sleep apnea among our physicians in the Latin-American community.

Methods: Cross sectional survey study done in Ecuador. We previously translated the questionnaire obstructive sleep apnea knowledge and attitude (OSAKA) in English to Spanish.

Results: Out of the 284 questionnaires delivered just 193 (68%) questionnaires were completed and analyzed. We found among questions that involved treatment of OSA that uvulopalatopharyngoplasty is curative for OSA (68%) and that laser-assisted uvuloplasty is an appropriate treatment for severe OSA (84%). 55% of respondents think that CPAP is the first line of treatment of OSA, however 91% think that treatment always begin with an automated CPAP before than a fixed CPAP.

Knowledge scores ranged from 0 to 19 (mean + SD = 10,4 + 2, 74). So fifty five percent 55%, of respondents got the questions right. Regarding the normal index of apnea in adults there is a clearly misunderstanding 75,6%. Concerning the complications of OSA no more than half of the respondents 43% know that hypertension is a long term complication, however 85,5% have a tendency to know that arrhythmias can occur with OSA.

Conclusion: In general there is a low knowledge of OSA among Latin-American physicians. In the treatment of OSA more than half still consider that surgery is the correct treatment for OSA, and even though half know that CPAP is the first line treatment only 8,8% will choose a fixed CPAP from the beginning of treatment. It is necessary to improve our education in the field of sleep apnea starting at medical school and among graduated physicians.

P2201**Modified sleep apnea clinical score: Is useful in our clinical practice?**

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Introduction: The aim of our work was to determine if the corrected neck perimeter (CNP) is useful in the OSAS severity prediction.

Methods: Descriptive study in which we have included 337 patients sent to the sleep unit by OSAS's clinical suspicion, from January 2007-2011 whom a polysomnography was realized. We calculated the CNP according to Flemong's formula, which adds 3cm to the measured neck perimeter if the individual is a snorer, other 3cm if they have episodes of choke or gasp most nights and 4cm if they are hypertense. There have not been included in this study the patients in whom we couldn't calculate the formula. We have considered 3 degrees of severity: 1 if the CNP is <43, 2 if it is between 43 and 48, and 3 if it is >48 cm. We consider a mild OSAS if the IAH is 5-15, moderate if it is between 15-30, and severe if IAH>30.

Results: The middle age of our patients was 50y (16-80); 78% males. The patient's percentage with different degrees of OSAS's severity according to his CNP is expressed in the table.

CPN	IAH <5	IAH 5-15	IAH 15-30	IAH >30
<43 (n=61)	17 (28%)	22 (36%)	8 (13%)	14 (23%)
43-48 (n=112)	18 (16%)	28 (25%)	29 (28%)	37 (33%)
>48 (n=164)	6 (4%)	30 (18%)	34 (21%)	94 (57%)

IAH's average was 24 in the group with CNP <43 cm, in the group 43-48 was 29, and in the >48, it was 42, being statistically significant difference (p<0,0001), when we use Anova one factor and proportion's contrast (squareXi).

Conclusions: The CNP is significantly correlated by the OSAS severity. By contrast in others studies, in our environment, the IAH> 5 probability post test, is 72%, when the CNP is > 43, and doesn't predict severity. The IAH> 5 probability post test is 96% if the CPN is > 48 and predicts OSAS severity.

P2202**Web-based follow-up of CPAP compliance in obstructive sleep apnea syndrome: A pilot study**

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Introduction: Despite its fast penetration in many fields, the application of information and communication technologies in the clinical practice is still very limited, especially in respiratory medicine. The Obstructive Sleep Apnea Syndrome (OSAS) is a disease in which, because of its prevalence and chronic nature, telemedicine has a great potential.

Objective: To develop and to assess the feasibility of a web-based follow-up of continuous positive pressure airway pressure (CPAP) therapy in OSAS patients.

Methods: An easy-structured web site was created for this study and each patient was given access to his/her own data exclusively. By visiting the web site, patients could answer to a weekly questionnaire about symptoms, sleep quality, potential CPAP side effects, physical activity and body weight, having the patient access to continuously updated temporal trends in graphical format. Moreover, informative documents about OSAS and CPAP therapy were available to free download.

Results: On a total of 163 consecutive patients of the Sleep Clinic, 66 reported minimum knowledge of the Internet and agreed to participate. After 12 weeks of monitoring, the participation rate was high (82%). In addition, patients responded to a satisfaction survey through the website, showing a level of agreement to the statement "Overall I am satisfied with the web service" of 4.3±0.58 points (1 = I strongly disagree, 5 = I strongly agree) and their potential interest in participating in a long-term web-based monitoring.

Conclusions: The results of this pilot study show the potential usefulness of the Internet as a tool for home monitoring of OSAS patients and CPAP compliance improvement.